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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.07/NVP/CSR-10/1621/CUBE/2016-17 23.11.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* **Customer** : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

* **Agency** : **Mr. Ninganagowda V. Patil,**
#57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.

* **Name of the work** : Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.

* **Reference** : AEE/KSD/PR/253/2016-17 Dated: 05.10.2016

* **Sample ID** : Road Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

* **Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 23.11.2016

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	26.10.2016	23.11.2016	8.099	482.3	21.44
2	26.10.2016	23.11.2016	8.176	496.5	22.07
3	26.10.2016	23.11.2016	8.235	513.2	22.81

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* Information is furnished by the Customer/Representative

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****

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Quality Manager

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T-2377

Job No.: CTCE/BBMP/W.No.07/NVP/CSR-10/1621/CUBE/2016-17 23.11.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* **Customer** : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

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* **Name of the work** : Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.

* **Reference** : AEE/KSD/PR/253/2016-17 Dated: 05.10.2016

* **Sample ID** : Road Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

* **Grade of Concrete** : M_{15}

Compressive Strength as on : 28th day

Sample Received on : 23.11.2016

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	26.10.2016	23.11.2016	8.120	478.3	21.26
2	26.10.2016	23.11.2016	8.255	506.3	22.50
3	26.10.2016	23.11.2016	8.325	516.3	22.95

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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.07/NVP/WMM/Gradation/2016-17 : 14.11.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

Agency : **Mr. Ninganagowda V. Patil,**
#57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.

Name of Work : Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.

Reference : AEE/KSD/PR/253/2016-17 Dated: 05.10.2016

Date of Testing : 14.11.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	150	150	3.0	97.0	95-100
22.4	1605	1755	35.1	64.9	60-80
11.2	925	2680	53.6	46.4	40-60
4.75	820	3500	70.0	30.0	25-40
2.36	525	4025	80.5	19.5	15-30
0.600	350	4375	87.5	12.5	8-22
0.075	450	4825	96.5	3.5	0-8

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Job No.: CTCE/BBMP/W.No.07/NVP/WMM/Gradation/2016-17 : 14.11.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

Agency : **Mr. Ninganagowda V. Patil,**
#57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.

Name of Work : Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.

Reference : AEE/KSD/PR/253/2016-17 Dated: 05.10.2016

Date of Testing : 14.11.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	155	155	3.1	96.9	95-100
22.4	1525	1680	33.6	66.4	60-80
11.2	985	2665	53.3	46.7	40-60
4.75	900	3565	71.3	28.7	25-40
2.36	650	4215	84.3	15.7	15-30
0.600	320	4535	90.7	9.3	8-22
0.075	305	4840	96.8	3.2	0-8

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Job No.: CTCE/BBMP/W.No.07/NVP/WMM/AIV/2016-17 14.11.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of the Work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	14.11.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	387	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines	22.02	22.22	
	100* (W_2/W_1)%			22.12

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.07/NVP/WMM/AIV/2016-17 14.11.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of the Work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	14.11.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	77	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines	20.37	20.94	
	100* (W_2/W_1)%			**20.66**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.07/NVP/WMM/S-T/2016-17 14.11.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of Work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	14.11.2016

Result : Flakiness Index = **12.32%**

Elongation Index = **13.52%**

Result : Combined Flakiness & Elongation index 25.84%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.07/NVP/WMM/S-T/2016-17 14.11.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of Work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	14.11.2016

Result : Flakiness Index = **11.05%**

Elongation Index = **13.20%**

Civil-Tech Consultants & Engineers Bangalore

Result : Combined Flakiness & Elongation index 24.25%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No: CTCE/BBMP/W.No.07/NVP/CSR-10/1621/SDBC(QB)/2016-17 21.11.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer**, Kodigehalli Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
*NAME OF THE WORK	:	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
*SAMPLE ID	:	Bitumen – Sample 1
DATE OF SAMPLING	:	19.11.2016
PERIOD OF TESTING	:	19.11.2016 to 21.11.2016

The results of the tests conducted on the bitumen sample using for Semi Dense Bituminous Concrete.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	82	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	45	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min.75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	296	Min. 220

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/AIV/2016-17 21.11.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of the Work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	21.11.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	388	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	306	306	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.13	21.34	21.24

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Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/Shape_T/2016-17 21.11.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of Work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	21.11.2016

Result : Flakiness Index = **11.83%**

Elongation Index = **13.47%**

Result : Combined Flakiness & Elongation index **25.30%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/Stripping/2016-17 23.11.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of the work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.11.2016

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/Sp_Wa/2016-17 23.11.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of the Work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	23.11.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2022	2023	2026	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1272	1273	1276	
4	Weight of saturated surface dry aggregate in air	W_3 g	2020	2021	2025	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	748	748	749	
6	Weight of oven dried aggregate	W_4 g	2008	2011	2010	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.684	2.689	2.684	2.686
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.728	2.725	2.738	2.731
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.60%	0.50%	0.75%	0.61%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/Bitumen/2016-17 23.11.2016

BITUMEN DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC : SP : 11 - 1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
NAME OF THE WORK	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
SAMPLE I/D	Roads in Amruthahalli, Ward No.07,
DATE OF TESTING	23.11.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/Bitumen/2016-17 23.11.2016

GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS : 2386 and IRC : SP : 11 - 1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
NAME OF THE WORK	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
SAMPLE I/D	Roads in Amruthahalli, Ward No.07,
DATE OF TESTING	23.11.2016

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	25.36	5.34	5.34	94.66	90-100
4.75	248.96	52.41	57.75	42.25	35-51
2.36	54.32	11.44	69.19	30.81	24-39
1.18	51.26	10.79	79.98	20.02	15-30
0.3	28.79	6.06	86.04	13.96	9-19
0.075	37.98	8.00	94.04	5.96	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	33.68	7.11	7.11	92.89	90-100
4.75	259.87	54.82	61.93	38.07	35-51
2.36	56.32	11.88	73.81	26.19	24-39
1.18	43.15	9.10	82.92	17.08	15-30
0.3	24.23	5.11	88.03	11.97	9-19
0.075	29.55	6.23	94.26	5.74	3-8

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/AGG/2016-17 23.11.2016

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of the Work	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	23.11.2016

Total Weight of Sample: **5650** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade II MORTH specification
9.5	450	8.0	7.96	92.04	90-100	
4.75	2965	52.5	60.44	39.56	35-51	
2.36	755	13.4	73.81	26.19	24-39	
1.18	450	8.0	81.77	18.23	15-30	
0.3	360	6.4	88.14	11.86	9-19	
0.075	315	5.6	93.72	6.28	3-8	

Total Weight of Sample: **5600** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade II MORTH specification
9.5	385	6.9	6.88	93.13	90-100	
4.75	2965	52.9	59.82	40.18	35-51	
2.36	635	11.3	71.16	28.84	24-39	
1.18	440	7.9	79.02	20.98	15-30	
0.3	350	6.3	85.27	14.73	9-19	
0.075	480	8.6	93.84	6.16	3-8	

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/Stability/2016-17 23.11.2016

TEST REPORT ON STABILITY OF MIX

Customer	:	**Asst. Executive Engineer**, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	:	**Mr. Ninganagowda V. Patil,** #57/7, Sri Krishna Nilaya, 2nd Main, Ganganagara, R.T. Nagara (P), Bangalore – 32.
Name of the Work	:	Improvements to Roads & Drains near Gangamma Temple area Amruthahalli in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	:	AEE/KSD/PR/253/2016-17 Dated: 05.10.2016
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Semi Dense Bituminous Concrete
Date of Testing	:	23.11.2016

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, Kn	8.35	8.45	8.2 Kn (min)
2	Marshal flow, mm	2.55	3.10	2 – 4
3	Percent air voids in Mineral Aggregate	3.25	3.60	3 – 5
4	Voids in Compacted Mix	13.10	13.90	13 – 15
5	Percent Voids filled with Bitumen	66.85	66.90	65 - 78
6	Density, g/cc	2.25	2.26	--

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